We claim:

1. An optical device, comprising:

a substrate having a plurality of channels therethrough;

a plurality of shutters, with respective shutters associated with respective channels in the substrate; and

a plurality of lenses, each lens having a body portion and a head portion, with respective body portions of the lenses disposed in respective channels of the substrate.

2. The optical device of claim 1, wherein the plurality of lenses comprise a polymer material.

3. The optical device of claim 1, wherein the plurality of lenses comprise an oxide film material.

4. The optical device of claim 1, wherein the plurality of lenses comprise a nitride film material.

5. The optical device of claim 1, the substrate having a first refractive index and the plurality of lenses having a second refractive index, wherein the first refractive index is less than the second refractive index.

6. A method, comprising:

forming a substrate with a plurality of channels therethrough; and

forming a lens array on the substrate with each lens self-aligned with a respective channel in the substrate.

7. The method of claim 6, further comprising:

spinning a polymer on the substrate, wherein the polymer fills the channels and accumulates outside the substrate.

8. The method of claim 7, further comprising:

positioning a plurality of masks over the accumulated polymer, wherein each mask is disposed between channels of the image array; and

exposing the polymer to radiation, producing unexposed polymer and exposed polymer.

9. The method of claim 8, further comprising:

bathing the polymer in a solvent, causing the unexposed polymer to dissolve away.

10. The method of claim 9, further comprising:

heating the exposed polymer until the exposed polymer assumes a convex shape.

11. A method, comprising:

depositing an oxide film on a substrate, the substrate having a plurality of channels, wherein the oxide film fills the plurality of channels from a first end to a second end and accumulates outside the second end of the substrate; and

positioning a plurality of masks over the oxide film, wherein each mask is disposed over one of the plurality of channels, the plurality of masks being graded in a convex shape.

12. The method of claim 11, further comprising:

plasma-etching the oxide film, separating the oxide film into a plurality of oxide film portions, one for each channel, wherein the oxide film portions are substantially convex-shaped.

13. A method, comprising:

depositing a nitride film on an image array, the image array comprising a substrate with a plurality of channels, wherein the nitride film fills the plurality of channels and accumulates outside the image array; and

positioning a plurality of masks over the nitride film, wherein each mask is disposed over one of the plurality of channels, the plurality of masks being graded in a convex shape.

14. The method of claim 13, further comprising:

plasma-etching the nitride film, such that a plurality of nitride film portions remain on the image array, one for each channel, wherein the nitride film portions are substantially convex-shaped.

15. An optical device, comprising:

a diffraction grating, comprising a plurality of channels disposed within a substrate, the channels having a predetermined shape; and

a microlens array, comprising a plurality of microlenses, wherein each microlens comprises a head portion and a body portion, the head portion being convex and the body portion having the predetermined shape, the microlens array being self-aligned with the diffraction grating;

wherein the body portion of each microlens of the plurality of microlenses fits into one of the plurality of channels and the head portion of each microlens of the plurality of microlenses extends outside a second end of the substrate.

16. The optical device of claim 15, wherein the head portion of a first microlens touches the head portion of an adjacent microlens.

17. The optical device of claim 16, wherein the microlens array comprises a polymer material.

18. The optical device of claim 16, wherein the microlens array comprises an oxide film.

19. The optical device of claim 16, wherein the microlens array comprises a nitride film.

20. The optical device of claim 16, wherein the substrate has a first refractive index and the microlenses of the microlens array have a second refractive index and the first refractive index is smaller than the second refractive index.

21. The optical device of claim 20, further comprising:

a light source for sending light rays toward the diffraction grating, to be received by the head portion of each microlens, the light rays comprising first light rays, second light rays, and third light rays;

wherein the first light rays travel within the channel boundary and are received into the channel and the second light rays travel within the active pixel region, but outside the channel boundary, and are refracted by the microlens and received into the channel.

22. The optical device of claim 21, wherein the third light rays travel outside the active pixel region, are refracted by the microlens, but are reflected off the substrate as fourth light rays.

23. The optical device of claim 22, wherein some of the fourth light rays are reflected by the microlens back into the channel according to the principle of total internal reflection.

24. A system, comprising:

a light source; and

an image array positioned to receive light from the light source, wherein the image array includes a self-aligned microlens array formed thereon.

25. The system of claim 24, the image array further comprising a substrate having a plurality of channels formed therethrough, the substrate having a first refractive index.

26. The system of claim 25, the self-aligned microlens array further comprising a plurality of lenses, one for each channel of the image array, each lens having a head portion and a body portion, wherein the body portion completely fills its respective channel.

27. The system of claim 26, wherein the self-aligned microlens array has a second refractive index, wherein the first refractive index is less than the second refractive index.